

Durable
Douglas Fir

*America's Permanent
Lumber Supply*

*Important West Coast Woods—*DOUGLAS FIR · WEST COAST HEMLOCK · WESTERN RED CEDAR · SITKA SPRUCE
WEST COAST LUMBER TRADE EXTENSION BUREAU — SEATTLE, U.S.A.

A short time ago Douglas Fir was hardly known on the Atlantic Seaboard except by engineers who used it for beams and timbers in docks, wharfs and buildings where structural strength was the first requirement. In 1919 it began to appear there for the first time for home building and general use.

The total shipments from the West Coast mills to the Atlantic Coast in 1920 were slightly in excess of 50 million board feet. Without any concentrated effort towards sales or advertising, this demand climbed to 1700 million board feet in 1925 — an increase in this territory alone of more than 3400 per cent in five years.

Whatever your building plans, you will find well manufactured Douglas Fir in practically every lumber market in the United States.

*Ask your architect, engineer or lumber
dealer about Douglas Fir—or write to the*

WEST COAST LUMBER TRADE
EXTENSION BUREAU

5560-62 Stuart Building
SEATTLE, WASHINGTON

Durable
Douglas Fir
AMERICA'S PERMANENT
LUMBER SUPPLY

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DURABLE DOUGLAS FIR

America's Permanent Lumber Supply

By PROF. BROR L. GRONDAL, M. Sc. F.

Wise forest protection does not mean the withdrawal of forest resources, whether of wood, water or grass, from contributing their full share to the welfare of the people, but, on the contrary, gives the assurance of larger and more certain supplies. The fundamental idea of forestry is the perpetuation of forests by use. Forest protection is not an end of itself; it is a means to increase

So did Douglas Fir, 73 years ago, foliage hundreds of feet into the air. make its deep impression on one the brown trunk of the Douglas Fir of the first travelers into the Pacific Northwest. towers over acre after acre. Stands are so dense that sunlight rarely penetrates to the green forest floor.

It remains today, *Theodore Roosevelt* These were the forests at which Winthrop marveled. Forests at which the world marvels as the story of



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College of Forestry, University of Washington

" . . . the trail took us speedily into a forest temple. Long years of labor by artists the most unconscious of their skill had been given to modeling these columnar firs. Unlike the pillars of human architecture, chipped and chiseled in bustling, dusty quarries and hoisted to their site by sweat of brow and creak of pulley, these rose to fairest proportion by the life that was in them, and blossomed into foliated capitals three hundred feet overhead." — *"Canoe and Saddle,"* by Theodore Winthrop, 1853.

So did Douglas Fir, 73 years ago, make its deep impression on one of the first travelers into the Pacific Northwest.

It remains today, as it was in the time of Winthrop, monarch of the forest regions in Washington and Oregon. Thrusting a green crown of

foliage hundreds of feet into the air, the brown trunk of the Douglas Fir towers over acre after acre. Stands are so dense that sunlight rarely penetrates to the green forest floor.

These were the forests at which Winthrop marveled. Forests at which the world marvels as the story of



DURABLE DOUGLAS FIR..



Young growth of Douglas Fir on land cut over 25 years before, the trees growing 30 to 40 feet high. It is estimated that the annual new forest growth on cut over land alone in the West Coast forest regions is 3 billion feet per year.

For twenty-five years or more there has been a concerted effort to create an impression that the merchantable lumber supply of the United States was on the verge of disappearance. As a fact there is a larger stand of high grade merchantable timber between the Rocky Mountains and Pacific Ocean today than there ever was in the states of New York, Pennsylvania, Wisconsin, Michigan and Minnesota.

On the slopes of the Cascades alone, reaching to the shores of the blue Pacific, are 26 million acres of towering trees—Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar. Mighty trees, all of them, but the king of the forest is Douglas Fir, comprising seventy per cent of the West Coast forest stand. One Douglas Fir tree, here, sometimes produces more lumber than five acres of trees in other forest districts.

Nowhere in America has Nature provided such abundant means for reforestation as in the cool green depths of the Douglas Fir region. Climatic conditions, fertility of soil, abundant moisture—all are ideal for new forest growth. Stored in the moist duff of the forest floor are seeds without number waiting for the sunlight which can only reach the seedlings as the age-ripe timber is cut. For, say foresters, "Without logging, there can be no silviculture, and without silviculture, no forestry."

It is estimated that the growth in new forests on cut-over land alone represents more than 3 billion feet annually. With present day fire protection and modern methods of lumbering and forestry, it is rightly estimated that the West Coast forests will supply the lumber wants of the Nation for all time.

Douglas Fir is being told today. You will find them here on the slopes from Cascade mountain heights to Pacific ocean beaches.

Winthrop could not classify the new tree which he described. He called it "fir" for want of a better name. Other early voyagers found the same difficulty. The great tree had leaves like yew, bark of a kind which had never been seen before, wood that was like pine, but with far less resin and not excessively heavy, but tough and strong like spruce, and beautiful and easy to work. And all these characteristics were combined with an astonishing durability — the wood for the American home.

How Douglas Fir was named

For more than a quarter of a century this newly discovered tree remained without a distinctive name. It was not until 1826, when the Royal Horticultural Society sent David Douglas, a Scotch botanist, to the Oregon country to study this tree that Douglas Fir was given its own botanically distinctive generic name. For it is not pine, spruce and by no means fir. It stands alone and unique among commercial woods. Therefore, the name "Douglas Fir" has come to be regarded as descriptive of this single species.

Nearly one-third of all the stand-

"Douglas Fir is the strongest resinous wood, pound for pound, that has ever been tested. It seems possible that this extra strength is due in part to the spiral reinforcements which are found in the cells, and which are pictured in the photomicrograph at the right. Yew is the only other American softwood having similar reinforcing."—Prof. Bror L. Grondal, M. Sc. F., College of Forestry, University of Washington.



DURABLE DOUGLAS FIR...



A unique and beautiful treatment for vertical grain Douglas Fir finish has been developed by a prominent architect. The wood is covered with a rubber stencil, the exposed portions being subjected to a sandblast which etches out the softer portion of the annual rings. When the stencil is removed the summerwood remains outlining the figures and providing a delicacy of treatment that is almost beyond belief. The stencil for a pilaster panel may be a Renaissance scroll; in a large panel it may be a complete picture. This finish lends itself wonderfully to the designs that characterize a stained glass window, or to the simple massed poster type of treatment. It may be colored and will make enduring tapestry effects.

ing timber in the United States at the present time is found in the Douglas Fir region. Here a new and distinctive type of forestry is required. Elsewhere, forestry is expensive; cut-over areas must either be reforested by leaving seed trees, laboriously planting seedlings, or by removing trees only when they reach a certain size.

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Volunteer growth aids forestry

But in this, the greatest forest in America, foresters prescribe other methods. Douglas Fir must be cut clean; must be harvested like wheat. The trees in a Douglas Fir forest are typically even-aged and all must be removed to make room for the new growth. After logging,

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something occurs that puzzled foresters for decades. Thousands upon thousands of seedlings — volunteers — appear until there is once again a dense forest.

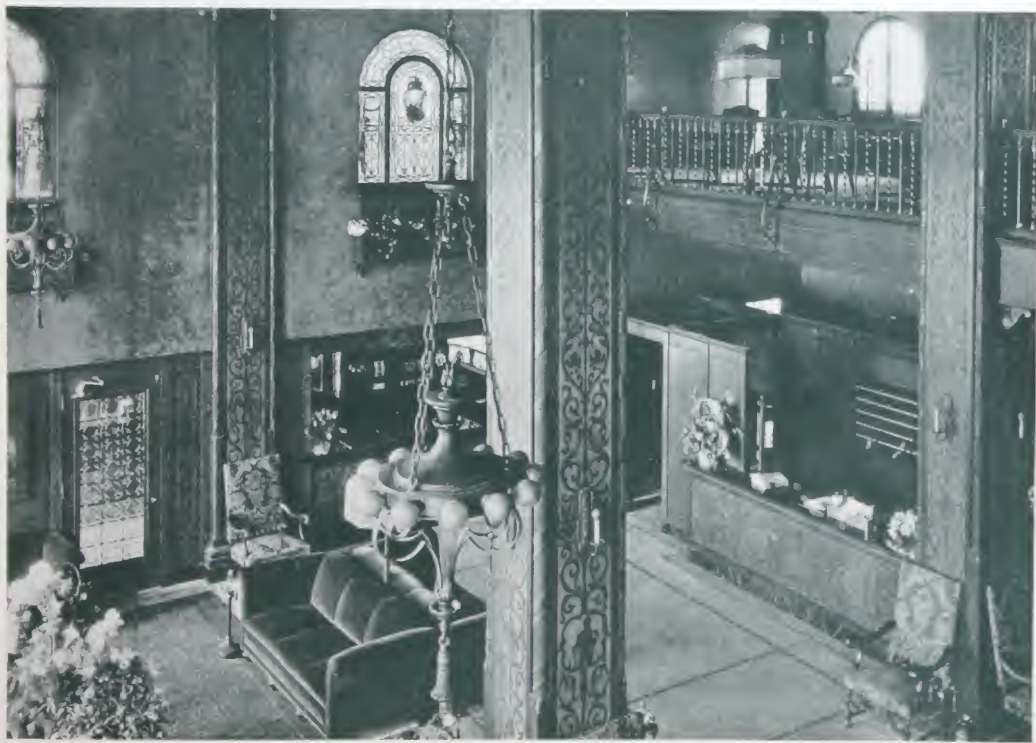
To foresters these seedlings are as great cause for rejoicing as was the annual overflow of the Nile to the ancient Egyptians — and once their origin was just as deeply shrouded in mystery.

Today foresters know that young growth comes chiefly from seed stored up in the moist duff of the forest floor, in some cases lying dormant for several years, awaiting only sunlight

to warm the ground and hasten germination.

In this positive manner a Douglas Fir forest with Nature's aid reestablishes itself. Careful protection of the young seedlings from ground fires is all that is necessary to insure continued crops of timber. Our national government, the several states, and associations of timber owners are all cooperating in the protection of growing forests.

Thus, man and Nature, uniting forces, are making possible a permanent supply of America's most valuable softwood — Douglas Fir.



A guest of this hotel, The Emerson, Hoquiam, Washington, was astonished to learn that what appeared from a distance to be expen-

sive tapestry, was Douglas Fir vertical grain finish, stenciled and treated as described and illustrated on the preceding page.



Above: "Japanese squares" on the dock ready to be shipped.

Below: Forty-eight cars of "Japanese squares" en route to the ocean docks.

Rapid growth insures quick crops

Douglas Fir grows with remarkable vigor. Forests that are only twenty-five years old usually contain trees that are forty feet high and therefore, a moderate increase in diameter produces a great increase in total volume. The growing of a new crop of Douglas Fir does not call for a century-long wait. In less than fifty years a second growth Douglas Fir forest will produce 30,000 board feet to the acre, a far heavier stand than is common in virgin forests in other sections of the United States.

When the last tree of the original

The Japanese buy Douglas Fir in huge squares, which are cut from the central portion of the log. In Japan, these squares are carefully, laboriously sawed with thin-bladed saws, often by hand, into the finest grades of framing lumber, sometimes right on the ground where a building is under construction.

stand of Douglas Fir has been cut some 100 years hence, logging operations will go on without a pause. Already the small proportion of cut-over and naturally reforested land alone in the Douglas Fir region is adding enough to the future lumber

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. . . America's Permanent Lumber Supply

supply to build 200,000 American homes every year. The virgin stands, in which Douglas Fir is the dominant tree, today contain more than 700 billion board feet!

Douglas Fir for your home

Just what is it about Douglas Fir that makes it such a superior material for home buildings? Why is a Douglas Fir home so much more interesting?

These are questions that can, of course, be answered in part by telling of the adaptability, strength and durability of Douglas Fir; how the heat of summer and cold of winter are moderated by this unusual wood; and that attractive designs are available.

Today in architectural magazines many of the newer houses shown are almost exact replicas of Colonial homes, built 200 years ago. Designers of that time followed the dictates of good design and common sense in their home planning. Just as the plan of the house was all important in those days, so it is today. Douglas Fir is easily adaptable to this dignified style of architecture and to any type of interesting combination.

In fact, good architecture is essential in planning the Douglas Fir home, for such buildings will last so long that care must be taken not to build them in such fashion that they will become old fashioned before they wear out. Fine architecture is fast



A large Douglas Fir log, not by any means the largest, has been opened up to produce wide cants of clear lumber without a blemish.

Note the very narrow sapwood and unusually large percentage of heartwood, which is mature wood, dependable and enduring.

DURABLE DOUGLAS FIR . .

becoming an important feature in American communities of every size and, by using Douglas Fir, such architecture may be carried out at a reasonable cost.

Climatic conditions often dictate the type of homes which must be built. Douglas Fir lends itself to any style of treatment and buildings can be constructed to withstand the icy blasts of winter as well as the extreme heat of summer.

In planning the house, space economy can be effected through the use of Douglas Fir. Excessively thick walls and partitions are not demanded. Plumbing fixtures can be easily installed and due to the high heat insulating efficiency of Douglas Fir, the annoyance of frozen pipes can be almost entirely avoided.

Doors of Douglas Fir in attractive designs and built in such a manner that they will not warp, shrink, swell, or stick can be installed at minimum



Douglas Fir is adaptable to your individual designs. No limitations are imposed upon the architect or builder when Douglas Fir is used.



This beautiful wood home won the Gold Medal of the Kansas City Architectural League. Clarence E. Shepard, Architect. Build your home of wood.

. . . America's Permanent Lumber Supply

Douglas Fir is the kind of wood that stays in place under trying conditions and because it is mostly all heartwood, weathers evenly without checking, splitting or warping. It takes paint and holds it. These inherent qualities are insurance against depreciation.



From the sturdiest framing to the delicate beauty and fine texture of interior trim, Douglas Fir answers every purpose adequately.



Douglas Fir is today being used for home building as framing, rafters, joists, sills, flooring, siding, window frames, sash and interior trim.

Fine homes of Douglas Fir that are so much admired today will remain as examples of beautiful architecture for succeeding generations.



DURABLE DOUGLAS FIR..

cost. Window frames and sash resist the action of the elements and are just as available for the modest homes as for the costly hotel.

Built-in furniture of edge grain Douglas Fir, combined with Douglas Fir plywood panels, is easily installed while the house is under construction and adds greatly to its

For exterior exposures such as sleeping porches, porch floors, window frames, sash and doors, pergolas, garden furniture, steps, Douglas Fir is unusually serviceable and durable. Its large per cent of all-heart wood and practically no sap renders it resistant to weather in exposed places and in contact with soil.



Page Ten

value and beauty. Woodwork of kitchens and bathrooms can be enameled in white, cream, or delicate colors, for Douglas Fir holds enamel tenaciously. The surface hardness insures long service and the finish is easily cleaned.

The economy of Douglas Fir in home construction is very marked. Grades are uniform and the quality of the lumber is at once apparent to careful builders. Trim from joists and studdings can be used for fire stops at no additional expense.

However, the irresistible appeal of Douglas Fir has a deeper and more basic foundation than a mere recital of its qualities. Douglas Fir brings into the home that touch of sunshine that has made its cells — the life and beauty of the growing tree, the freshness of the western forest, the comfort of a home made of a superior wood.

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. . . America's Permanent Lumber Supply

Douglas Fir is supreme as framing lumber — it is light, stiff, strong and durable, yet easy to saw. There is little or no tendency to twist or warp and because of its close texture holds nails well, even when driven in the green lumber.



Douglas Fir is adaptable to every architectural design in home building. It is essentially an all-purpose wood for general house construction.



Douglas Fir has great strength, yet because of its fine grain and texture is easy to work. It is comparatively low in cost and has no superior for framework.



endure — in which the family will have increasing pride as the years go by! Such a home may be built of Douglas Fir for you and yours!

Douglas Fir ideal for interiors

Wherever Douglas Fir has been sold, it has at once become the standard wood in the finest homes. In wide, vertical grain it provides material which is quiet and unobtrusive, taking stain evenly and giving as beautiful a texture as many expensive hardwoods. As a base for paint

and enamel, it is highly satisfactory, and is extremely durable for either interior or exterior work.

Flat grain Douglas Fir presents a very striking and beautiful figure and is used in great quantities for paneling. Very large and wide three-ply panels, cut on rotary lathes and bonded together with water-resistant cement, are rapidly growing in popularity — and no equivalent material can be produced from any other softwood. Panels of this kind, when

DURABLE DOUGLAS FIR..



Courtesy, Schack,
Young & Myers,
Architects, Seattle.

In home building, Douglas Fir finds a fitting place. The clear grades, always furnished for interior finish, are uniform in color and texture and of great beauty of grain. When cut for molding, casing and base, the mitred corners fit tightly and stay put.



stained in driftwood gray and bordered with vertical grain rails and stiles, resemble handsome pictures in frames to emphasize their beauty.

Soft grays or pale greens are favorite tones in the treatment of Douglas Fir, but such other colors as the deep red of mahogany, the dark brown of walnut and the lighter browns and tans of oak are also popular. When finishing in light tones, to bring out the full beauty of the wood an acid stain, rather than an oil stain, should be used.

One architect has developed a unique and beautiful treatment for vertical grain Douglas Fir finish. The wood is covered with a rubber stencil, the exposed portions being

subjected to a sandblast which etches out the softer portion of the annual rings. When the stencil is removed the summerwood remains as a delicate hatchure, outlining the figures and providing a delicacy of treatment that is almost beyond belief.

The stencil for a pilaster panel may be a Renaissance scroll; in a large panel it may be a complete picture. The finish lends itself wonderfully to the designs that characterize a stained glass window, or to the simple massed poster type of treatment. It may be colored and will make enduring tapestry effects.

Douglas Fir flooring is produced in uniform grades, and when edge grained or "rift sawed" is uniform in

texture, pleasing in color, and wear resisting. For floors that are exposed to the weather, as on porches, the superiority of Douglas Fir flooring is readily apparent wherever it has been introduced. When stained, varnished, and waxed, it presents a very pleasing effect. Joints remain tight and snug, and the floor level and true, for Douglas Fir has little tendency to warp.

The durability and staying qualities of Douglas Fir have made this wood very popular for siding and rustic. It remains in place without twisting and pulling nails, and pro-

vides a surface upon which paints will adhere without blistering and peeling. In shop grades it offers material for sash and frames that is as durable as white pine with the added strength and stiffness that is an inherent quality of Douglas Fir.

The clear grades of Douglas Fir are used on the Pacific Coast almost to the exclusion of other species. They have not gone into distant markets to the same extent as have the dimension and timber grades, but wherever they have been used they have met with instant favor, and their use in these markets is rapidly developing.



Striking effects were achieved with Douglas Fir in building the beautiful new Alfred H. Anderson memorial building of the College of Forestry at the University of Washington. Here is shown the magnificent assembly hall, with Douglas Fir arches.

In the lobby of the Regents' Room at the University of Washington the beautiful panels and wainscoting are of Douglas Fir acid stained, rubbed and waxed. This style of treatment is growing in popularity—for it is at once beautiful and distinctive.





An unusual Douglas Fir exterior suggestive of the chalet type.

The dignity and simplicity of this office interior is made possible by the use of vertical grain trim and panels, finished in hand-rubbed gray, varnished and waxed. Douglas Fir is easily worked, and is remarkably free from warping, splitting and shrinking, and is hard enough to withstand unusual wear.



Douglas Fir is unique among woods

The scientific name of Douglas Fir, *Pseudotsuga taxifolia*, recognizes the fact that the leaves are like those of Yew. In the wood another startling resemblance manifests itself. *Douglas Fir and Yew are the only American softwoods in which the inner walls of the cells are reinforced with minute, thread-like spirals!* (See page 3.)

It is of course manifestly impossible to measure accurately the extent

to which the unusual strength of Douglas Fir depends upon the presence of these spirals. The fact does remain, however, that Douglas Fir is stronger, pound for pound, than any other resinous wood. This means much to the builder. These spiral reinforcements are more numerous than in Yew, and unquestionably strengthen the cells without increasing the tendency of the wood to swell and contract when moisture is absorbed. They also make it possible to identify Douglas Fir even under low magnifications.

Resin is rather sparingly distributed in Douglas Fir. The minute so-called "resin ducts" are usually confined to the harder layer of the annual ring, or the "summer wood," while still smaller resin passages are found in some of the pith rays. Douglas Fir can be readily distinguished from the pines by means of this characteristic, for in the latter the resin ducts are larger and are abundantly scattered throughout the annual ring in both the summer wood and the spring wood. The non-durable firs, which belong to an entirely different group of trees, contain no resin ducts, and must not be confused with Douglas Fir. Common usage—there being no adequate word to describe this wood—has simply appropriated the word "fir" to coin the name of Douglas Fir.

*Why it is **DURABLE** Douglas Fir*

A complete explanation for the durability of Douglas Fir has never been advanced. Research indicates that the bordered pits of each cell are usually sealed up as the sapwood of the tree gradually changes into decay-resisting heartwood through the infiltration of mineral matter. Each cell therefore offers individual resistance to the penetration of decay-producing organisms, and it may be that this accounts for the long life that Douglas Fir exhibits under adverse conditions. The durability of Douglas Fir often equals that of White Oak, the king of hardwoods.

Douglas Fir, like White Oak, offers considerable resistance to the penetration of liquids, and for this



Douglas Fir panels and trim were chosen as a fitting background for art displays in the gallery of the Omaha Society of Fine Arts.

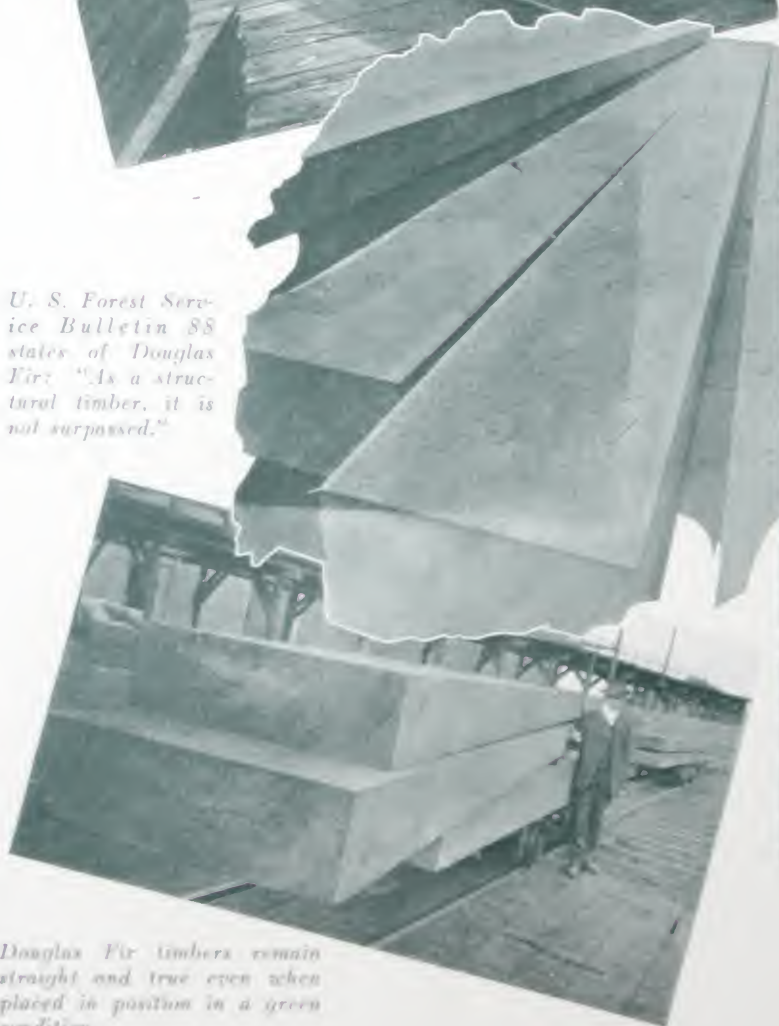
The woodwork is stained a soft grey-brown and waxed, a finish which brings out the natural satin figured pattern of Douglas Fir.

Douglas Fir produces the largest commercial timbers in existence. For example, timbers 18 inches by 18 inches by 156 feet 6 inches and 54 inches by 54 inches by 74 feet have been cut.

DURABLE DOUGLAS
America's Permanent Lumber



U. S. Forest Service Bulletin 88 states of Douglas Fir: "As a structural timber, it is not surpassed."



Douglas Fir timbers remain straight and true even when placed in position in a green condition.



Out in the Douglas Fir country on the W. photographer who makes a study of the found he could not bring the true size of the Douglas Fir. With real used two negatives and which compares the size of office buildings.

DOUGLAS FIR
Lumber Supply

The creosoting of Douglas Fir is an industry that is growing rapidly.



Strength values of Douglas Fir timbers may be applied in engineering calculations with entire confidence.



Wide Douglas Fir planks can readily be supplied for special purposes.



entry on the West Coast a specialty of forest pictures his pictures a conception of Fir. With real ingenuity he created this composite picture Douglas Fir with ten-story

© Cress, Seattle



Liberty Pole in City Hall Park, New York City, erected in 1766 to celebrate the Repeal of the Stamp Act, was again erected in 1921, of Douglas Fir, with a top-mast of White Pine.

same reason is used to a considerable extent in the manufacture of barrels, tanks and wood stave pipe. Stains therefore penetrate the wood slowly, as in Oak, so that they may be evenly applied.

Douglas Fir is king of structural timbers

As a structural timber, Douglas Fir is strong and dependable. In proportion to its dead weight Douglas Fir is stronger than concrete, thus greatly reducing the load which the foundation of a structure must carry.

Structural steel is much heavier than Douglas Fir in proportion to its load carrying capacity. Douglas Fir has *thirty per cent* greater tensile strength than steel per pound of weight, and unlike steel, is not subject to crystallization, or *fatigue*.

The tables on pages 21 and 22 present recommended working stresses for Douglas Fir as computed by the Forest Products Laboratory of the United States Forest Service, the paragraph numbers referring to the standard yard and railroad grading rules adopted January 1, 1926, by the West Coast Lumbermen's Association.

In material graded for density, in addition to the close grain required in the Structural Grades, stresses 10 per cent greater than those given in the table for Structural Grades may be used, except in Modulus of Elasticity.

No. 1 Common Grades

No. 1 common grades are based on general utility and appearance as well as on strength properties. They contain some provisions not required in strictly structural grades, and do not fully conform to others, necessary of consideration when working stresses are to be assigned.

The greater part of material graded on No. 1 Common grades of West Coast Standard Yard and Railroad Grading Rules would, however, meet the requirements of the Common Structural grades of American Lumber Standards for Joist and Plank.

It is more difficult to compare Timber grades with Beam and Stringer grades on account of the difference in the method of measuring knots. The majority of No. 1 Common Timbers would, however, meet the requirements of the Common Beam and Stringer grade of American Lumber Standards, although beams and stringers would ordinarily be required in a grade permitting higher working stresses.

West Coast No. 1 Common Timbers have practically the same knot limitations as the Select Post and Timber grade of American Lumber



When Secretary of the Navy Wilbur sent out an appeal urging patriotic Americans to assist in raising a fund to restore the Frigate

Constitution, lumbermen of Washington and Oregon were called upon to furnish the masts and spars of Douglas Fir.

DURABLE DOUGLAS FIR..



If you would ask at Washington, D. C., about the Pan-American Union Building you would be told that when it was open to the public thousands of visitors inspected the Douglas Fir room every week and that it was a source of great delight to them. This main reception room, built seventeen years ago of Douglas Fir, grows in beauty as time passes. The wood is stained a dark, rich cherry which emphasizes the beauty of the satin figured pattern, a characteristic of Douglas Fir.

Standards, and with limitation on angle of grain and shake could be used at only slightly lower working stresses, the Select grade of American Lumber Standards requiring close grain. Close-grained No. 1 Common meeting the requirements of angle of grain and shake would be equivalent to the Structural grade.

Technical data on the strength of Douglas Fir may seem to be of little interest to the home builder, but the fact that Douglas Fir combines such unusual strength and stiffness with durability is of vital importance. A home built of Douglas Fir is a home that will endure. Storms may damage any structure, but a well constructed Douglas Fir building pro-

. . . America's Permanent Lumber Supply

vides an additional factor of safety that cannot be lightly dismissed.

The holding power of nails in

Douglas Fir is high, for as the fibres are pushed aside by the penetrating point, the stiff yet elastic wood closes

STRUCTURAL GRADES

Conforming to American Lumber Standards Basic Provisions for "Select".

Use and Paragraph	Condition of Exposure	Extreme Fibre	Maximum Shear	Compression Across Grain	Modulus of Elasticity
Pounds per Square Inch					
<i>Joist and Plank R. R. Grades Par. 143</i>	Continuously Dry	1600	90	350	1,600,000
	Occasionally Wet	1250	90	240	1,600,000
	Usually Wet	950	90	215	1,600,000
<i>Beams and Stringers Yard Grades Par. 203 R. R. Grades Par. 147</i>	Continuously Dry	1600	90	350	1,600,000
	Occasionally Wet	1400	90	240	1,600,000
	Usually Wet	1100	90	215	1,600,000
		Compression Along Grain			
<i>Posts and Timbers R. R. Grades Par. 151</i>	Continuously Dry	1200		350	1,600,000
	Occasionally Wet	1100		240	1,600,000
	Usually Wet	900		215	1,600,000



In building a floating span to carry cars from transfer boats to the end of the trestle, the Central Railroad of New

Jersey made splendid use of the great strength and relatively light weight of durable Douglas Fir.

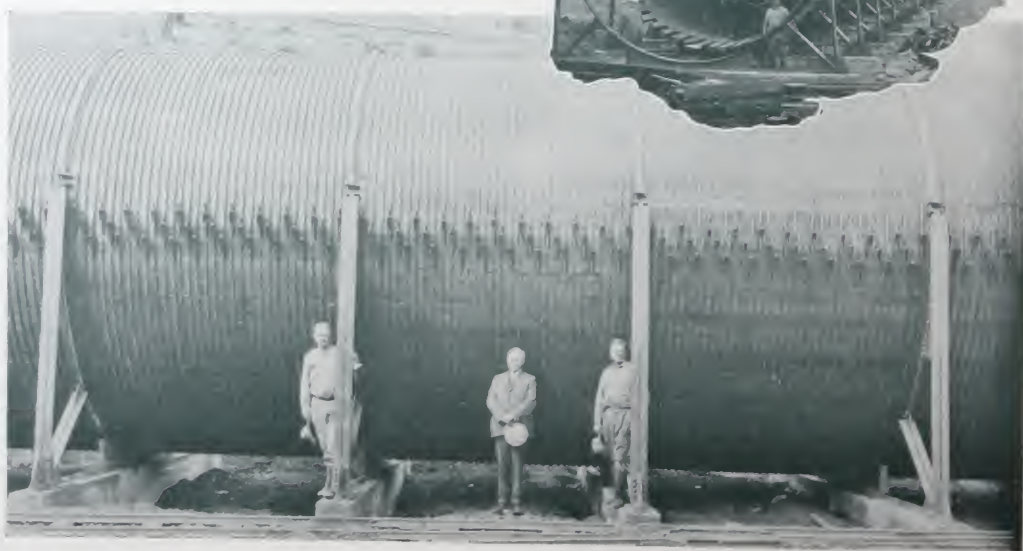
DURABLE DOUGLAS FIR . .

WORKING STRESSES FOR NO. 1 COMMON GRADES

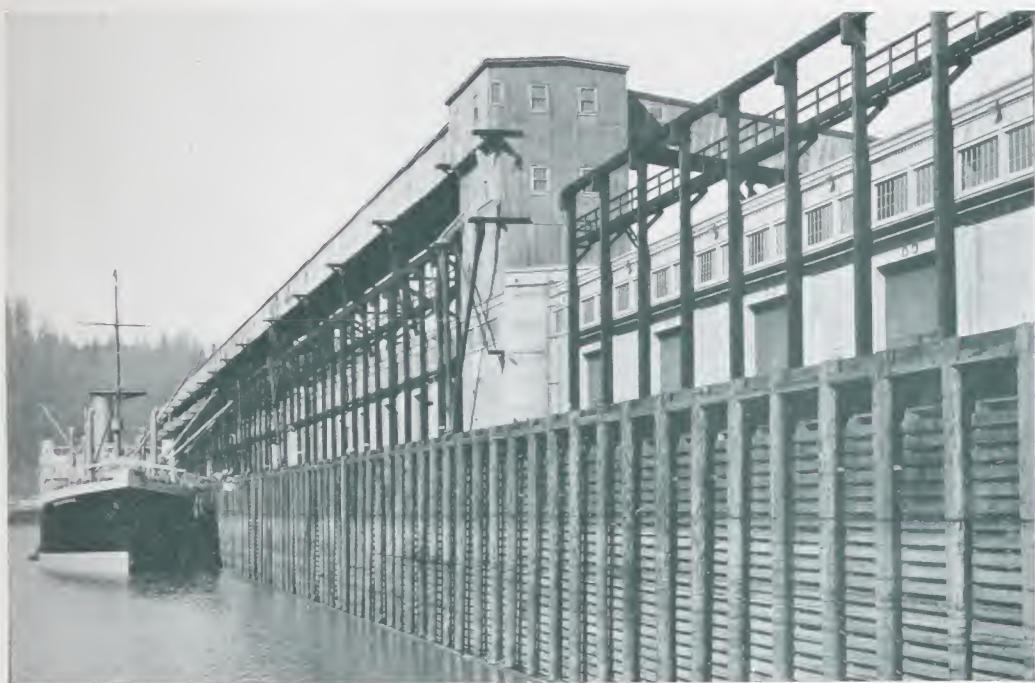
When Conforming to the Additional Requirements of the Common Structural Grade of American Lumber Standards.

Use and Paragraph	Condition of Exposure	Extreme Fibre	Maximum Shear	Compression Across Grain	Modulus of Elasticity
Pounds per Square Inch					
<i>Joist and Plank</i> Yard Grades <i>Par. 194</i>	Continuously Dry	1200	72	325	1,600,000
	Occasionally Wet	1000	72	225	1,600,000
	Usually Wet	750	72	200	1,600,000
<i>Beams and Stringers</i> Yard Grades <i>Par. 199</i>	Continuously Dry	1200	72	325	1,600,000
	Occasionally Wet	1000	72	225	1,600,000
	Usually Wet	800	72	200	1,600,000
		Compression Along Grain			
<i>Posts and Timbers</i> Yard Grades <i>Par. 199</i>	Continuously Dry	1100		325	1,600,000
	Occasionally Wet	1000		225	1,600,000
	Usually Wet	850		200	1,600,000

This 16-foot Douglas Fir pipe line built in connection with the California-Oregon Power Company's hydro-electric development in Northern California, is undoubtedly the largest wooden conduit ever built for any purpose. Unlike steel and concrete pipe, Douglas Fir wood pipe retains its carrying capacity indefinitely.



Page Twenty-two



One of the Port Commission docks, Portland, Oregon. On many waterfronts of the Pacific ports are great wharves — the largest ever built, carried on creosoted Douglas Fir piling.

A scientific study of dock structures in San Francisco bay, sponsored by the National Research Council, demonstrated the superiority of Douglas Fir over all other materials.

on the nail with a vise-like grip. In exterior woodwork, nails are tenaciously retained even when the wood is subjected to alternate wetting and drying. High wind pressures on exposed porches therefore do comparatively little damage.

The stiffness of Douglas Fir sheathing provides strength that resists tremendous blasts. The vibration that a storm develops in any type of structure may quickly loosen the nails in gypsum or fibre-board, but the nails will remain tight in Douglas Fir. Other materials of this character have little shock-resisting ability but, in the words of an engineer,

Douglas Fir can be momentarily stressed far beyond its elastic limit without suffering permanent harm.

The heat insulating capacity of Douglas Fir

The dead air spaces in the cell cavities of Douglas Fir effectively retard the transmission of heat and sound. Each cubic inch contains from six to ten million of these cells. As an insulating medium it is twice as effective as asbestos or corkboard. It is 20 times as effective as concrete, and 1,500 times as effective as steel! A Douglas Fir home is *truly* warmer in winter and cooler in summer.

DURABLE DOUGLAS FIR...

Due to the extremely low rate of heat conductivity exhibited by Douglas Fir, solid walls of this wood are often used as fireguards. This same characteristic is made use of in a practical manner in "mill construction," where large Douglas Fir timbers and heavy plank are used in erecting structures where the fire hazard must be very low, and the weight carrying capacity very high. Such buildings, when equipped with sprinkler systems, take a very low insurance rate, and are very favorably regarded by the unsentimental fire insurance underwriters. Proper fire-stopping will make any Douglas Fir structure slow-burning.

Still another comparison may be made between Douglas Fir and other common materials of construction. A third more heat is required to bring

Douglas Fir to a given temperature than concrete, and three times more than is required for iron! In an iron tank, water will freeze quickly. In a Douglas Fir tank ice is slow in forming. Ensilage in a concrete silo with walls many inches thick will freeze more quickly than in a durable Douglas Fir silo with staves of nominal thickness.

The following test to illustrate the relative heat conductivity of different materials can be made by anyone: Place the hand on a piece of iron at room temperature, or on a piece of stone or concrete, and note how cold it feels. The sensation of cold is due to the fact that heat is being conduct-

In place of the sled teams, the knock-down camp and the river drives of old, the Douglas Fir industry has steam and electric skidders, the logging town and a railroad system on almost every logging operation.



. . . America's Permanent Lumber Supply

West Coast lumbermen operate on the theory that the forests of the West Coast will forever supply the lumber wants of the country. Both mills and towns are built for permanence. These pictures illustrate some of the modern lumber cities of the West Coast forest region.



The stability of the Douglas Fir industry is insured by the rapid growth of the new forests after the old-growth timber has been removed.



The growing appreciation of the excellent qualities of Douglas Fir has led to a great expansion of wood using industries, all contributing to the permanent success of forestry.

All of the great cities of the Douglas Fir region were founded upon the lumber industry. Permanent industries build permanent cities, and here the business of lumbering will continue for all time to come.



DURABLE DOUGLAS FIR...



When engineers were confronted with the problem of rebuilding the Welland Canal, they chose Douglas Fir timber for the lock gates. Here were required huge sticks at least three feet square and fifty feet long, of perfect timber, an order filled with Douglas Fir as a matter of routine by a West Coast mill. Durability and strength are demanded for permanent work of this nature, and the logical answer here was Douglas Fir.



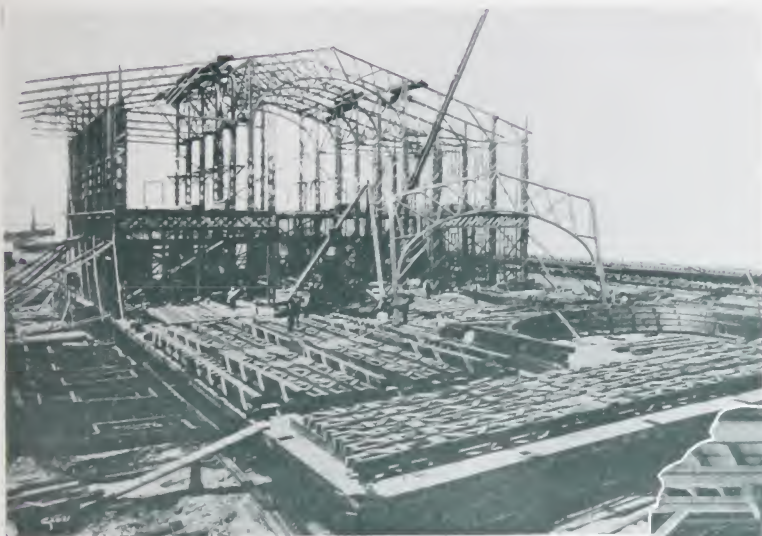
ed away from the hand very rapidly. Steel railway coaches are hard to heat uniformly, and the reason why is obvious. No building is more comfortable in all kinds of weather than the Douglas Fir home.

The seasoning of Douglas Fir

There is no step in the manufacture of lumber that is of more importance than proper seasoning. Here the ease with which Douglas Fir can be quickly and uniformly dried is of importance to every user of wood. Kiln drying has been brought to a very high state of perfection in the Douglas Fir region.

and lumber is dried in air that is circulated by large fans while the proper temperature and humidity are maintained by automatic instruments.

Douglas Fir is not subject to sap-staining, and it may therefore be dried slowly and carefully. For this reason, even air-seasoned yard stock is remarkably free from checking, as extra open piling to ensure quick seasoning is unnecessary. Drying conditions in the Douglas Fir region are never harsh and unfavorable. The lumber storage yards are clean and sanitary, and sound, bright lumber is invariably produced.



*The wide, clear
cants of Douglas
Fir are re-cut into
commercial sizes
with the aid of
extra heavy, true-
running machinery
built especially for
Douglas Fir mills.*

*The adaptability of Douglas
Fir was strikingly illustrated
at the Panama Pacific Interna-
tional Exposition, where it was
used in the entire construction
of the Oregon Building. Doug-
las Fir trusses were fabricated
on the ground and raised into
position in the same manner in
which structural steel is ordi-
narily employed. Here, too,
Douglas Fir demonstrated its
desirability in its delicate beau-
ty as interior finish and trim.*



*Douglas Fir braces
twenty to forty feet
in length supported
the entire wall of
the street in this
forty-foot excava-
tion.*



DURABLE DOUGLAS FIR..



The 5000 windows of the world's largest hotel, the Stevens, under construction in Chicago, will have vertical grain Douglas Fir sash and frames.



The North American Building, Chicago, built in 1910, is another example of the durability of Douglas Fir sash and frames.



The First National Bank Building of Pittsburgh, built in 1910, is a fine example of the durability of vertical grain Douglas Fir sash and frames.



Douglas Fir doors are installed throughout this fine apartment house — the Parkview, Memphis, Tenn.

The architect who built the New Detroit Theatre and Office Building chose Douglas Fir sash and frames for durability.

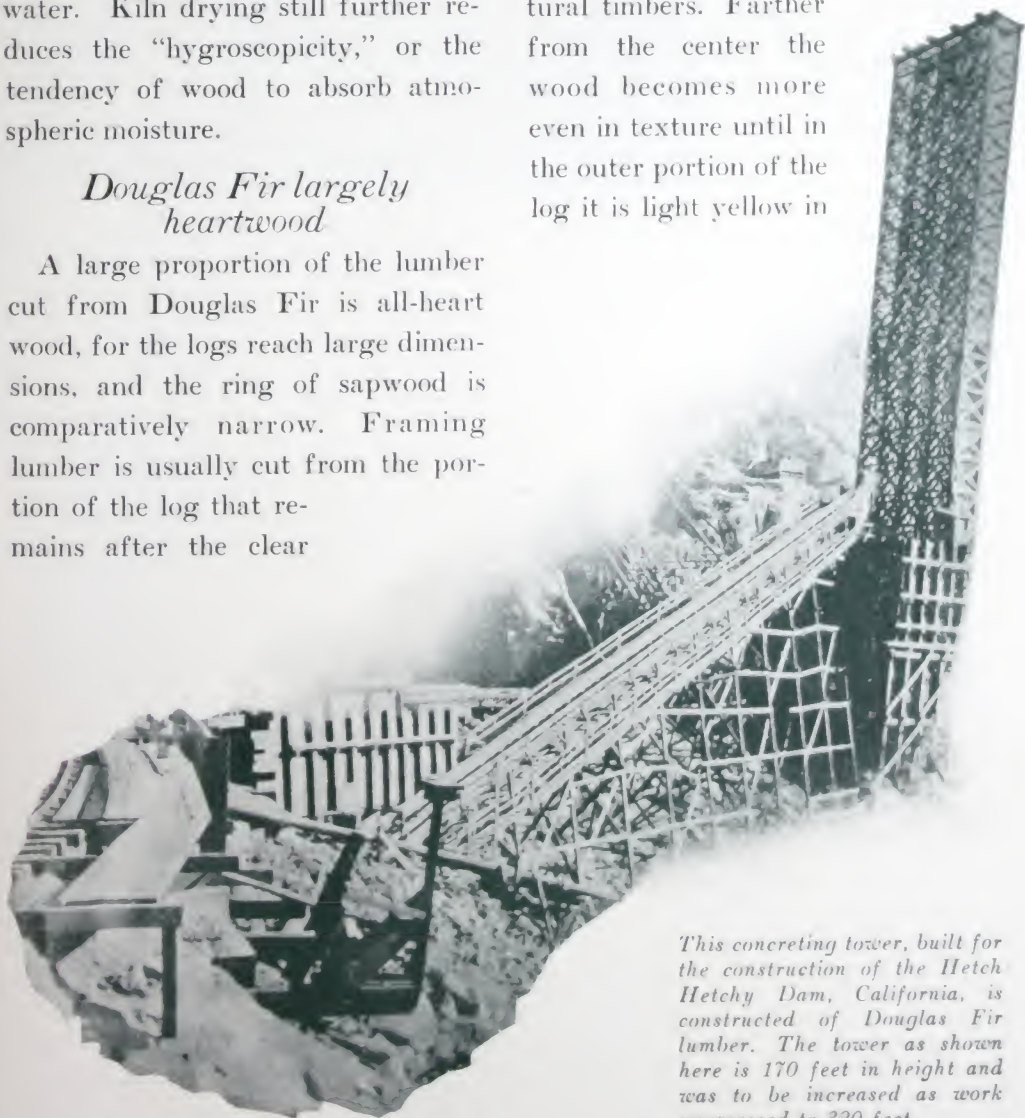
The fact that Douglas Fir absorbs moisture slowly even when air dried is illustrated by the results of an experiment made by the United States Forest Products Laboratory. Air dry pieces of Douglas Fir, 4x4 inches in cross section and 4 feet long were not saturated even after *four months* of complete immersion in water. Kiln drying still further reduces the "hygroscopicity," or the tendency of wood to absorb atmospheric moisture.

Douglas Fir largely heartwood

A large proportion of the lumber cut from Douglas Fir is all-heartwood, for the logs reach large dimensions, and the ring of sapwood is comparatively narrow. Framing lumber is usually cut from the portion of the log that remains after the clear

lumber has been removed and is therefore usually entirely of durable heartwood.

Douglas Fir produces wood suitable for a great many uses, depending upon the portion of the tree from which it is cut. In a large, old-growth tree the wood at the center is usually hard and tough, and suited for structural timbers. Farther from the center the wood becomes more even in texture until in the outer portion of the log it is light yellow in



This concreting tower, built for the construction of the Hetch Hetchy Dam, California, is constructed of Douglas Fir lumber. The tower as shown here is 170 feet in height and was to be increased as work progressed to 320 feet.

In Japan Douglas Fir is much in favor as a construction material for there the frequency of earthquakes demands strong framing material.



color, fine-grained, soft and suitable for the manufacture of the finest grades of sash and doors, finish and interior trim, furniture, airplane wing-beams and similar exacting uses.

Yellow and red Douglas Fir are often produced by the same tree, and the reason for the difference in color is often asked. Color seems to be associated mainly with the rate of growth. Rapidly grown wood is red; slowly grown wood is yellow. Smaller trees may be yellow or red throughout, depending upon the rate at

which they have grown. No difference in strength can be noted between equivalent grades of red and yellow Douglas Fir, and both are equally resistant to decay.

The forest companions of Douglas Fir

Associated with Douglas Fir in the forests of the Pacific Northwest are three of America's finest special-purpose woods, Western Red Cedar, West Coast Hemlock, and Sitka Spruce.



The durability of Douglas Fir commends it for the building of all farm structures. It is both adaptable and economical. Because of its large percentage of heartwood, it strongly resists weathering.



During 1925 Douglas Fir went to every important lumber consuming country in the world. This map shows the amount exported in millions of board feet. The

solid black in the circles indicates percent of total shipments that was lumber and the shaded portion, hewed and sawed timbers and logs.

Western Red Cedar

Western Red Cedar, the giant arborvitae, is the largest and the finest of the cedars. The strong but soft and evenly textured aromatic wood is remarkably durable, even when placed in contact with the soil. Entirely free from pitch it takes and holds paint remarkably well. As bevel siding it is used in finishing the finest homes. Second in size only to Douglas Fir, the giant logs yield wide clear lumber that shows almost no tendency to check or warp.

Western Red Cedar can be safely used for the most critical work. For the manufacture of shingles, no other wood offers equal advantages. Edge-grain Western Red Cedar shingles do not curl and twist, and when nailed with copper or zinc-clad nails are guaranteed by the manufacturers to last from forty to fifty years. They take and hold stains without discoloring the finest tints. For poles and posts, again no other wood offers equal advantages, and tremendous quantities are used for this purpose.

West Coast Hemlock

West Coast Hemlock, which often reaches a height of 160 feet and a diameter of five feet, produces wood of unusually fine quality. It is especially suitable for the finest grades of flooring, as under the most extreme wear it shows no tendency to sliver. Many mills are now producing West Coast Hemlock flooring, finished according to the standards used in manufacturing hardwood. This is one of the few woods that does not darken with age, and a floor of West Coast Hemlock will remain bright and smooth for an indefinite period. Exceedingly strong in proportion to its weight, West Coast Hemlock is extensively used as a framing material. For boxes, light weight and great strength have placed this wood in the lead, and in the manufacture of sulphite paper pulp. West Coast Hemlock ranks with the finest grades of spruce.

Sitka Spruce

Sitka Spruce, like its associates, is a large forest tree, sometimes reaching a height of 180 feet and a diameter of twelve feet. The wood is very uniform in quality, possessing great toughness and strength. On account of this uniformity it is especially valuable for sounding boards in fine musical instruments, such as violins and pianos. As an airplane timber it is unsurpassed, and during the world war a special regiment, known as the Spruce Production Division, was organized especially to log this valuable wood. For bevel siding, boxes, interior trim that is to be enameled, and as shop lumber, Sitka Spruce is unsurpassed. As a pulpwood it is used in the production of the finest grades of paper. The finest grades of spruce are found near the coast in Washington and Oregon, where it grows even more rapidly than Douglas Fir.



These lumber manufacturers
are members of the
West Coast Lumber Trade Extension Bureau

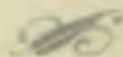
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Anderson & Middleton Lbr. Co.	Aberdeen,	Wash.	Monroe Logging Co.	Snohomish,	Wash.
Bay City Lumber Co.	Aberdeen,	Wash.	R. F. D. No. 4		
Beaver Lumber Co.			Mud Bay Logging Co.	Olympia,	Wash.
1004 Pacific Building	Portland,	Ore.	Mumby Lumber & Shingle Co.	Bordeaux,	Wash.
Bellpak Lumber & Timber Co.	Van Zandt,	Wash.	Murphy Timber Co.	Yacolt,	Wash.
Booth-Kelly Lumber Co.	Eugene,	Ore.	Mutual Lumber Co.	Bucoda,	Wash.
Brown, O. W., Loco. & Supply Co.			Nehalem Timber & Logging Co.,		
532 Lumber Exchange Bldg.	Seattle,	Wash.	1004 Pacific Building	Portland,	Ore.
Buchanan Lumber Co.	Olympia,	Wash.	Nettleton Lumber Co.		
Canyon Lumber Co.	Everett,	Wash.	4th & Seneca,	Seattle,	Wash.
Carlisle Lumber Co.	Onalaska,	Wash.	North Bend Timber Co.	North Bend,	Wash.
Cascade Timber Co.	Tacoma,	Wash.	North End Lumber Co.	Tacoma,	Wash.
Central Coal & Coke Co.			Olympia Harbor Lumber Co.	Olympia,	Wash.
Keith & Perry Building	Kansas City,	Mo.	Oregon-American Lumber Co.	Vernonia,	Ore.
Chehalis Mill Co.	Salkum,	Wash.	Ostrander Ry. & Timber Co.	Ostrander,	Wash.
Cherry Valley Logging Co.	Everett,	Wash.	Owen-Oregon Lumber Co.	Medford,	Ore.
Christenson Logging Company			Pacific Spruce Corporation		
362 Pittock Block	Portland,	Ore.	Northwestern Bank Building	Portland,	Ore.
Cispus Logging Co.	Tacoma,	Wash.	Pacific States Lumber Co.	Tacoma,	Wash.
Clark-Nickerson Lumber Co.	Everett,	Wash.	Peninsula Lbr. Co., Drawer 4198,	Portland,	Ore.
Clear Fir Lumber Co.	Tacoma,	Wash.	Phoenix Logging Co.		
Clemons Logging Co.	Tacoma,	Wash.	White Building	Seattle,	Wash.
Clough Lumber Co.	Stanwood,	Wash.	Reed Mill Company	Shelton,	Wash.
Coats, A. F., Lumber Co.	Tillamook,	Ore.	Ridgefield Lumber Co.	Ridgefield,	Wash.
Cobbs & Mitchell Co.			Robinson Mfg. Co.	Everett,	Wash.
Northwestern Bank Building	Portland,	Ore.	Sauk River Lbr. Co.		
Colby Lumber Co., Inc.			201 First Nat'l. Bk. Bldg.	Everett,	Wash.
White-Henry-Stewart Bldg.	Seattle,	Wash.	Seattle Mill & Logging Co.		
Crossett Western Co.	Wauna,	Ore.	10002 Rainier Avenue	Seattle,	Wash.
Dempsey Lumber Co.	Tacoma,	Wash.	Shafer-McLaughlin & Hillier, Inc		
Dickman Lumber Co.	Tacoma,	Wash.	Kenton Station	Portland,	Ore.
Ernest Dolge, Inc., Box 974,	Tacoma,	Wash.	Silver Falls Timber Co.	Silverton,	Ore.
Doty Lbr. & Shgl. Co.			Simpson Logging Co.	Shelton,	Wash.
Gasco Building	Portland,	Ore.	Skagit Mill Co.	Lyman,	Wash.
Eagle Lumber Co.	Westimber,	Ore.	Snoqualmie Falls Lumber Co.	Snoqualmie Falls,	Wash.
Emery & Nelson, Inc.	Napavine,	Wash.	Sound Timber Co.		
Fischer Lumber Co.	Marcola,	Ore.	946 Henry Building	Seattle,	Wash.
Flanigan, Walter, Lumber Co.	Acme,	Wash.	Springer Mill Co.	Olympia,	Wash.
Foster-Newbegin Lumber Co.	Tacoma,	Wash.	Stimson Timber Co.		
Globe Lumber Co.	Globe,	Wash.	700 Westlake North	Seattle,	Wash.
Green Mountain Logging Co.	Kerry,	Ore.	St. Paul & Tacoma Lbr. Co.	Tacoma,	Wash.
Hama Hama Logging Co.			Straits Lumber Co.	Red Gap,	B. C.
503 Marion Building	Seattle,	Wash.	Sunset Timber Co.	Raymond,	Wash.
Henry Mill & Timber Co.	Tacoma,	Wash.	Wallace Falls Timber Co.	Gold Bar,	Wash.
Irving-Hartley Logging Co.	Twin,	Wash.	Wallace Lumber & Mfg. Co.	Sultan,	Wash.
Knappton Mills & Lumber Co.			Walton Lumber Co.	Everett,	Wash.
Pittock Block	Portland,	Ore.	Walville Lumber Co.	Walville,	Wash.
K-P Timber Company	Kerry,	Ore.	West Fork Logging Co.	Tacoma,	Wash.
Lincoln Creek Lumber Co.	Centralia,	Wash.	West Oregon Lumber Co.	Linnton,	Ore.
Long-Bell Lumber Co.	Longview,	Wash.	Westport Lumber Co.	Westport,	Ore.
Luedinghaus Lumber Co.			West Waterway Lumber Co.		
633-8 Pacific Building	Portland,	Ore.	P. O. Box 3205	Seattle,	Wash.
Mason County Logging Co.	Bordeaux,	Wash.	Weyerhaeuser Timber Co.	Everett,	Wash.
Maughlin Lumber Co.	Snohomish,	Wash.	Wheeler, C. H.		
Merrill & Ring Lbr. Co.,			Yeon Building	Portland,	Ore.
White Building	Seattle,	Wash.	Wheeler-Osgood Co.	Tacoma,	Wash.
Geo. T. Mickle Lbr. Co.	North Portland,	Ore.	Willapa Lbr. Co., Gasco Bldg.,	Portland,	Ore.
Miller, E. C., Cedar Lbr. Co.	Aberdeen,	Wash.	Williams Fir Finish Co.		
Mineral Lake Logging Co.	Tacoma,	Wash.	600 Myrtle Street	Seattle,	Wash.
Mohawk Lumber Co., Ltd.	New Westminster,	B. C.	Wood, E. K., Lumber Co.	Bellingham,	Wash.
			Wood & Iverson, Inc.	Hobart,	Wash.



